

23. (New Claim) A magnetic recording medium adapted for longitudinal magnetic recording, comprising:

at least one exchange layer structure; and

a magnetic layer formed on said exchange layer structure, said exchange layer structure including:

a ferromagnetic layer; and

a non-magnetic coupling layer, having a thickness of approximately 0.8 nm, provided on said ferromagnetic layer and under said magnetic layer, said ferromagnetic layer and said magnetic layer having antiparallel magnetizations.

REMARKS

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached Appendix is captioned "Version with markings to show changes made."

As a preliminary matter, enclosed herewith is a verified translation of Japanese Priority Document No. 11-161329. Applicants request acknowledgement that the June 8, 1999 priority date has been perfected.

Claims 2, 4, 6, 8, 10, 14, 16 and 18 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have cancelled

Claims 14, 16 and 18, without prejudice, thus rendering this rejection moot with respect to these claims. However, with respect to Claims 2, 4, 6, 8 and 10, Applicants respectfully traverse this rejection.

Applicants have amended Claims 2, 4, 6, 8 and 10 to place them in better form, without narrowing the scope thereof. Applicants respectfully submit that these claims, as amended, comply with 35 U.S.C. § 112, second paragraph. Accordingly, Applicants respectfully request the withdrawal of this § 112, second paragraph, rejection.

Claims 1-7 and 13-18 stand rejected under 35 U.S.C. § 102 (b) as being anticipated by U.S. Patent No. 5,701,223 to Fontana Jr. et al. (hereinafter "Fontana"). As indicated above, Claims 13-18 have been canceled, without prejudice, thus rendering this rejection moot with respect to these claims. However, with respect to Claims 1-7, which have not been amended in response to this rejection, Applicants respectfully traverse this rejection.

Applicants respectfully submit that the Fontana reference fails to disclose the present invention as defined in independent Claim 1. Specifically, Fontana discloses a multi-layered sensor or head for reading/writing signals from/to a magnetic recording medium. In contrast, the present invention, as recited in independent Claim 1, is directed to a "magnetic recording medium." The claimed magnetic recording medium is completely different from a head or a sensor (such as that described in Fontana).

Additionally, the Examiner is reminded that the preamble of Claim 1 of the present application, which recites "A magnetic recording medium comprising:" must be

given patentable weight because it is essential to pointing out the claimed invention by giving life and meaning to the claim, and it is not merely an intended use clause. *Compare Kropa v. Robie and Mahlman*, 88 USPQ 478, 481 (C.C.P.A. 1951) (patentable weight given to preamble “An abrasive article”) with *C.R. Bard Inc. v. M3 Systems Inc.*, 48 USPQ2d 1225 (Fed. Cir. 1998) (no patentable weight given to italicized intended use portion of following preamble: “A biopsy needle *for use with a tissue sampling device having . . .*”). Thus, as in *Kropa*, the present preamble “A magnetic medium” should be given patentable weight because it is essential for defining the claimed invention.

For these reasons, Applicants respectfully request the withdrawal of this §102(b) rejection of Claims 1-7.

Claims 1-7 and 13-18 stand rejected under 35 U.S.C. § 102 (b) as being anticipated by “Spin valve films with synthetic ferrimagnetics (Co/Ru/Co) for pinned layers” to Kawato et al. (hereinafter the “Kawato reference”). As indicated above, Claims 13-18 have been canceled, without prejudice, thus rendering this rejection moot with respect to these claims. However, with respect to Claims 1-7, which have not been amended in response to this rejection, Applicants respectfully traverse this rejection.

Applicants respectfully submit that the Kawato reference fails to disclose the present invention as defined in independent Claim 1. Specifically, the Kawato reference, like the Fontana reference, discloses a multi-layered head for reading/writing signals from/to a magnetic recording medium. In contrast, the present invention, as recited in independent Claim 1, is directed to a “magnetic recording medium.” As mentioned above, the claimed

magnetic recording medium is completely different from a head. Accordingly, Applicants respectfully request the withdrawal of this §102(b) rejection of Claims 1-7.

Claims 1-18 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,851,643 to Honda et al. (hereinafter "Honda") in view of U.S. Patent No. 6,143,388 to Bian et al. (hereinafter "Bian"). As indicated above, Claims 13-18 have been canceled, without prejudice, thus rendering this rejection moot with respect to these claims. However, with respect to Claims 1-12, which have not been amended in response to this rejection, Applicants respectfully traverse this rejection.

Applicants respectfully submit that the cited references, alone or in combination, fail to disclose or suggest all of the features of the present invention. Specifically, neither Honda nor Bian, alone or in combination, disclose or suggest the claimed magnetic recording medium including, *inter alia*, "said ferromagnetic layer and said magnetic layer having antiparallel magnetizations," as defined in independent Claim 1.

Briefly, the present invention relates to a magnetic recording medium adapted for longitudinal magnetic recording that includes an exchange layer structure and a magnetic layer. The exchange layer structure further includes a ferromagnetic layer and a non-magnetic coupling layer, where the ferromagnetic layer of the exchange layer structure and the magnetic layer have antiparallel magnetizations, i.e., these layers are magnetized in opposite directions that are parallel to each other and to a plane parallel to the recording surface of the disk.

In contrast to the claimed invention, with antiparallel layers, Figures 7a and 7b of the Honda reference show an example of a magnetic recording medium where the magnetic domains 31 are disclosed as being magnetized "antiparallel" to each other. As can be seen in Figures 7a and 7b of Honda, the Honda reference relates to perpendicular magnetization (as opposed to the longitudinal magnetization of the present invention). Moreover, one skilled in the art would not consider that the separate "antiparallel" domains of Honda satisfied the claimed antiparallel layers.

In addition, the Bian reference does not disclose or suggest the claimed antiparallel layers, nor was it relied upon by the Examiner for this feature. Accordingly, as all of the features defined in independent Claim 1 are not disclosed or suggested in either Honda or Bian, alone or in combination, Applicants respectfully request the withdrawal of this § 103 rejection of independent Claim 1.

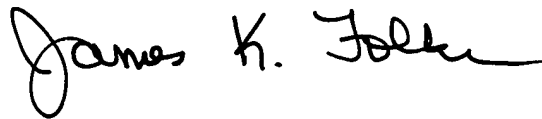
Claims 2-12 all depend, directly or indirectly, from independent Claim 1, and therefore include all of the features of Claim 1, plus additional features. Accordingly, Applicants respectfully request that the § 103 rejection of dependent Claims 2-12 under Honda in view of Bian be withdrawn considering the above remarks directed to independent Claim 1.

Additionally, Applicants have also added new Claims 19-23, which Applicants also submit are allowable over the references of record.

For all of the above reasons, Applicants request reconsideration and allowance of the claimed invention. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.



By

James K. Folker
Registration No. 37,538

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Suite 2500
300 South Wacker Drive
Chicago, Illinois 60606
(312) 360-0080

Customer No. 24978

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

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In the Claims:

Claims 1, 2, 4, 6, 8 and 10 have been amended as follows:

1. (Once Amended) A magnetic recording medium comprising:

at least one exchange layer structure; and

a magnetic layer formed on said exchange layer structure,

said exchange layer structure [comprising] including:

a ferromagnetic layer; and

a non-magnetic coupling layer provided on said

ferromagnetic layer and under said magnetic layer,

said ferromagnetic layer and said magnetic layer having antiparallel

magnetizations.

2. (Once Amended) The magnetic recording medium as claimed in

claim 1, wherein said ferromagnetic layer is made of a material selected from a group

consisting of Co, Ni, Fe, Ni[-based] alloys, Fe[-based] alloys, and Co[-based] alloys

[including] which include CoCrTa, CoCrPt, and CoCrPt-M, where M = B, Mo, Nb, Ta,

W or alloys thereof.

4. (Once Amended) The magnetic recording medium as claimed in claim 1, wherein said non-magnetic coupling layer is made of a material selected from a group consisting of Ru, Rh, Ir, Ru[-based] alloys, Rh[-based] alloys, and Ir[-based] alloys.

6. (Once Amended) The magnetic recording medium as claimed in claim 1, wherein said magnetic layer is made of a material selected from a group consisting of Co, and Co[-based] alloys [including] which include CoCrTa, CoCrPt and CoCrPt-M, wherein M = B, Mo, Nb, Ta, W or alloys thereof.

8. (Once Amended) The magnetic recording medium claimed in claim 7, which further comprises:

a non-magnetic intermediate layer interposed between said underlayer and said exchange layer structure,

said non-magnetic intermediate layer having a hcp structure alloy selected from a group consisting of CrCr-M, where M = B, Mo, Nb, Ta, W or alloys thereof, and having a thickness in a range of 1 to 5 nm.

10. (Once Amended) The magnetic recording medium as claimed in claim 7, wherein said underlayer is made of a B2 structure alloy selected from a group consisting of NiAl and FeAl.